

Coffee machine having a drawer through which it is supplied with a coffee pad

[001] The invention relates to a coffee machine.

5 [002] Coffee machines in the prior art operate according to different principles. The most common models are the so-called pressureless coffee machines. In these water flows from a storage container into an electrically heatable pipe. Particularly as a result of the evolution of steam in this pipe, heated water is then pushed through a riser to an outlet via which the heated water then drips into a coffee filter. The filter coffee can then flow from this coffee
10 filter at atmospheric pressure into a pot.

[003] In contrast, in espresso machines an elevated pressure prevails in the area of the coffee grounds, for example 15 bar. This is achieved by supplying water from a water container or another water supply to an electric-motor-driven pump which then supplies the water at high
15 pressure via an electrically heatable area to a coffee grounds receiving device. This coffee grounds receiving device generally comprises a filter for receiving the coffee. In order to generate the high pressure in the coffee area, during operation the coffee grounds receiving device is located in an area which is sealed towards the atmosphere, which can be designated as a pressure chamber or brewing chamber.

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[004] In another coffee machine which operates on a different principle, it is provided to first transfer the water for preparing the coffee from a water container into a heatable intermediate container. From this intermediate container the heated water is passed to an electric-motor-driven pump from which it is supplied at elevated pressure, for example 2 to 3 bar, to a coffee
25 grounds receiving device. In this case, it is provided that unlike in the espresso machine the coffee is not introduced into the coffee grounds receiving device in loose form as coffee grounds but is inserted in a retainer in the form of a coffee pad, that is, in compacted form surrounded by filter paper. The retainer with a retainer cover via which water is supplied can form a sealed pressure chamber. At the same time, the retainer for the coffee pads is allocated
30 a plurality of functions. Firstly, the retainer provides a sealing surface so that a pressure chamber can be formed. Moreover, the retainer has an outlet opening from which the coffee can emerge. Furthermore, the coffee pad should be mounted in the retainer in a manner such

that flow through the coffee pad is not impeded. Such a coffee machine occupies an intermediate position between a conventional pressureless coffee machine and an espresso machine.

- 5 [005] WO 01/15582 A1 relates to a coffee machine to which the coffee grounds are supplied in the form of coffee pads. The coffee pads are inserted in a lower portion of the brewing chamber and the upper portion of the brewing chamber can be folded onto the lower portion by the user by means of a hinge, wherein an engaging connection between the two housing portions which are hinged relative to one another provides for a seal of the brewing chamber.
- 10 A problem with this system is that after the brewing process the coffee pad can stick to the upper portion of the brewing chamber when opening the coffee machine. Another problem can arise if the coffee machine is actuated when opened since hot water can then spray in the direction of the user of the coffee machine.
- 15 [006] Known from EP 1 050 258 A1 is a coffee machine wherein coffee pads are inserted in a pulled-out drawer and are then brought into the brewing position by pushing in the drawer. For sealing the brewing chamber, a brewing chamber upper portion is automatically moved over the coffee pad from above before the brewing process. After the brewing process, the coffee pads are automatically removed inside the coffee machine in a collecting container.
- 20 Particularly as a result of the motor-driven components of the coffee machine, this is very complex and therefore expensive to produce.

- [007] It is the object of the invention to provide a simple solution for supplying and removing coffee pads, wherein in particular the risk of hot water spraying out should be eliminated and
- 25 wherein there is no possibility of the coffee pad remaining stuck to the upper portion of the brewing chamber.

[008] This object is achieved with the features of the independent claims.

- 30 [009] Advantageous embodiments of the invention are given in the dependent claims.

[010] The invention builds on the generic coffee machine in that a coffee pad retainer is located in the drawer and is at least partially encircled, in the pushed-in state of the drawer, by a retaining device which can be displaced in a substantially vertical manner so that the coffee pad retainer can be lifted by means of the retaining device and that a brewing chamber
5 surrounding the coffee pad is formed by lifting the coffee pad retainer. As a result of using a drawer for supplying the coffee pad, it is not necessary to move the water supply. This therefore remains in a position in which emerging water runs or sprays downwards and in particular, not in the direction of the user. Since the brewing chamber is only formed after lifting the coffee pad retainer, the drawer can be pushed into the coffee machine or removed
10 therefrom without being hindered by the sealing means. The coffee pad cannot remain stuck on the upper portion of the brewing chamber when pulling out the drawer since it is scraped thereby during the pulling-out movement.

[011] It is usefully provided that the retaining device comprises two clamps which enclose the
15 coffee pad retainer on opposite sides, which can be raised or lowered by a lever mechanism. This is a simple design of the retaining device which additionally allows controlled lifting and thus controlled sealing of the brewing chamber.

[012] The coffee machine according to the invention is advantageously further developed in
20 that each clamp has a continuation at its lower end which applies an upwardly directed force to the coffee pad retainer during lifting of the retaining device. It can also be ascertained here that a particularly simple solution is provided. In particular, it can be provided that the continuations grip underneath the coffee pad retainer. During lowering of the retaining device, the coffee pad retainer is thus transferred into its lowered position through gravity.

[013] It can also be provided that at least one of the clamps has a further continuation which
25 applies a downwardly directed force to the coffee pad retainer during lowering of the retaining device. It can hereby be achieved that jamming of the coffee pad retainer in its raised position is not a problem since the coffee pad retainer is actively entrained during lowering of the
30 retaining device.

[014] It is usefully provided that the lever mechanism is a hand-operated lever which is located on the upper side of the coffee machine. The manual actuation of the lever and thus the retaining device is a particularly cost-effective solution compared to automatically driven lowering or raising devices. The arrangement of the lever on the upper side of the coffee machine allows easy access and is thus a user-friendly [015] solution.

[016] The invention is based on the finding that a reliable and user-friendly possibility for supplying coffee pads is provided by a coffee pad retainer which can be raised and lowered in a drawer which can be supplied horizontally.

[017] The invention is now explained in detail with reference to the accompanying drawings using particularly preferred embodiments. In the figures:

[018] Figure 1a is a perspective view of a coffee machine in a first state to explain the invention;

[019] Figure 1b is a perspective view of a coffee machine in a second state to explain the invention;

[020] Figure 2a is a plan view of a drawer with a coffee pad retainer inserted;

[021] Figure 2b is a side view of a drawer with a coffee pad retainer inserted; and

[022] Figure 3 is a sectional view of a housing part of a coffee machine according to the invention.

[023] Figure 1a shows a perspective view of a coffee machine in a first state to explain the invention. Figure 1b shows a perspective view of a coffee machine in a second state to explain the invention. The coffee machine 110 according to the invention comprises a flat front portion 112 and a columnar rear assembly 114. Cups for removing coffee via an outlet 116 can be arranged on the front portion 112. A water container 118 is inserted in the rear

assembly 114. The rear assembly 114 further comprises a slide-in area 120 into which a drawer 122 with a coffee pad retainer inserted therein can be slid, this being described in further detail in connection with Figure 2. The drawer 122 is shown in the inserted state in Figure 1a and in the removed state in Figure 1b. Located above the slide-in area 120 inside the housing are a water supply and a retainer cover which together with the retainer sitting in the drawer 122 form the brewing chamber. This is sealed after inserting the drawer 122 by shifting the lever 124 and lifting the clamps 126, 128 hereby effected by pressing together the retainer and retainer cover.

[024] Figure 2a shows a plan view of a coffee pad retainer according to the invention inserted in a carrier. The carrier embodied as a drawer 210 has a base area 212 and an elevated edge area 214, 216. Guide continuations 218 are further provided to facilitate the insertion of the drawer 210 in the slide-in area 120 (see Figure 1b). The coffee pad retainer 220 is inserted in the drawer 210. An outlet opening 222 can be identified at the centre of the coffee pad retainer 220.

[025] Figure 2b shows a side view of a drawer with a coffee pad retainer inserted therein. It can be seen here that the drawer 210 is produced using little material and positively receives the coffee pad retainer 220. The coffee pad retainer 220 itself has a circumferential edge 224 and the base area 226 of the coffee pad retainer 220 is constructed as sloping towards the centre, that is towards the outlet opening 222. The base area 226 can be provided with spacers not shown here, which can be formed for example by knobs or circular segments having different angles of ascent. It is also possible to place a grid, for example, a wire grid on the base area 226 and thus ensure a spacing between the coffee pad and the base area 226.

[026] Figure 3 shows a sectional view of a housing part of a coffee machine according to the invention. Numerous details of the coffee machine according to the invention are shown. In particular, the brewing chamber 330 formed from the coffee pad retainer 320 and a retainer cover 328 can be seen. The retainer cover 328 is preferably made of elastic silicone whilst the coffee pad retainer 320 is made of hard plastic. Consequently, a sealed pressure chamber or a sealed brewing chamber 330 can be formed by pressing the coffee pad retainer 320 on to the retainer cover 328. The water required for preparing the coffee is supplied to a channel 332 above the brewing chamber 330 and from there it passes through openings in the retainer

cover 328, which are not shown, into the brewing chamber 330. Furthermore, projections 334 can be provided on the retainer cover 328 which press the inserted coffee pad against the coffee pad retainer 320. The coffee pad retainer 320 is pressed against the retainer cover 328 by lifting the clamps 336, 338. These clamps 336, 338 grip under the coffee pad retainer 320 with continuations at their lower end and rest on end regions of a shaft 340 with continuations at the opposite end. These end regions of the shaft 340 have a larger diameter in the sectional plane than perpendicular to the sectional plane so that the clamps 336, 338 can be lowered by twisting the shaft through 90°. The coffee pad retainer 320 can hereby be lowered whereupon it can be removed together with the drawer from the coffee machine.

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[027] The features of the invention disclosed in the preceding description, in the drawings and in the claims can be important for carrying out the invention both individually and also in any combination.

[028] **Reference list:**

[029]	110	Coffee machine
[030]	112	Front portion
[031]	114	Rear assembly
[032]	116	Outlet
[033]	118	Water container
[034]	120	Slide-in area
[035]	122	Drawer
[036]	124	Lever
[037]	126	Clamp
[038]	128	Clamp
[039]	210	Drawer
[040]	212	Base area
[041]	214	Edge area
[042]	216	Edge area
[043]	218	Guide continuations
[044]	220	Coffee pad retainer
[045]	222	Outlet opening
[046]	224	Circumferential edge
[047]	226	Base area
[048]	320	Coffee pad retainer
[049]	328	Retainer cover
[050]	330	Brewing chamber
[051]	332	Channel
[052]	334	Projections
[053]	336	Clamp
[054]	338	Clamp
[055]	340	Shaft